AMENDMENTS TO THE CLAIMS

A detailed listing of all claims that are, or were, in the present application, irrespective of whether the claim(s) remain(s) under examination in the application is presented below. The claims are presented in ascending order and each includes one status identifier. Those claims not cancelled or withdrawn but amended by the current amendment utilize the following notations for amendment: 1. deleted matter is shown by strikethrough for six or more characters and double brackets for five or fewer characters; and 2. added matter is shown by underlining.

1. (Withdrawn) A device for measuring an optical break-through which is created in a tissue, beneath a tissue surface, by treating laser radiation which a laser surgical unit focuses into a treatment focus, said focus being located in the tissue wherein said device comprises a detection beam path comprising optics, wherein the optics couple radiation emitted by the tissue from beneath the tissue surface, into the detection beam path, and a detector unit is arranged following the detection beam path, said detector unit generating a detection signal which indicates the spatial extent, position or both of the optical break-through in the tissue.

2. (Withdrawn) The device as claimed in Claim 1, further comprising an illumination radiation source, which directs illumination radiation into the tissue.

3. (Withdrawn) The device as claimed in Claim 2, wherein the illumination radiation source supplies the treating laser radiation.

4. (Withdrawn) The device as claimed in Claim 2, wherein the illumination radiation source and the detection beam path are part of an interferometer structure.

5. (Withdrawn) The device as claimed in Claim 4, wherein the interferometer structure comprises a measuring arm and an adjustable reference arm and the illumination radiation has a coherence length, in the direction of light propagation and in which the resolution at which the detection signal indicates the spatial extent depends on the coherence length, and wherein

interference appears only, if the lengths of the measuring arm and of the reference arm differ by no more than the coherence length.

6. (Withdrawn) The device as claimed in Claim 4, wherein the illumination source radiation focuses the illumination radiation into an illumination focus located in the tissue, wherein the position of the illumination focus is adjustable to generate the detection signal.

7. (Withdrawn) The device as claimed in Claim 6, wherein the illumination radiation is coupled into a light path of the treating laser radiation, and further comprising adjustable optics by which the divergence of the illumination radiation is changeable without changing the divergence of the treating laser radiation.

8. (Withdrawn) The device as claimed in Claim 1, wherein the detector unit detects the radiation emitted by the tissue by means of confocal imaging.

9. (Withdrawn) The device as claimed in Claim 8, wherein the detector unit generates the detection signal by adjusting the focus of the confocal imaging, preferably along a ray direction of the treating laser radiation.

10. (Withdrawn) The device as claimed in Claim 8, wherein the optics of the detection beam path have certain light dispersing properties, so that they comprise different focal points during confocal imaging for different spectral regions, wherein the detector unit effects a spectrally selective detection of the radiation recorded in the confocal imaging, to generate the detection signal.

11. (Withdrawn) The device as claimed in Claim 10, further comprising a multi-channel spectrometer for picking up radiation behind a pinhole.

12. (Withdrawn) The device as claimed in Claim 2, wherein the source of illumination radiation comprises a plurality of partial radiation sources, which are individually operable and have different spectral properties, so that spectral selective sensing is obtained by sequentially operating said partial radiation sources.

13. (Withdrawn) The device as claimed in Claim 1, wherein the detection beam path has an optical axis which is located obliquely to an optical axis of the treating laser radiation or of illumination radiation.

14. (Withdrawn) The device as claimed in Claims 2, wherein the source of illumination radiation causes a slit illumination of the tissue.

15. (Withdrawn) The device as claimed in Claim 13, further comprising a scanning unit by which the position of the optical axis of the detection beam path is adjustable relative to the optical axis of the treating laser radiation or of the illumination radiation.

16. (Withdrawn) The device as claimed in Claim 1, wherein the detector unit determines a measure of the spatial extent, the position or both of individual scattering centers, which are generated by the break-through.

17. (Withdrawn) The device as claimed in Claim 1, wherein the detection signal indicates a diameter of a plasma bubble, which was generated by an optimal break-through.

18. (Withdrawn) The device as claimed in Claim 1, further comprising a scanning device for scanning the tissue.

19. (Withdrawn) A method of measuring an optical break-through which is created in a tissue, beneath a tissue surface, by treating laser radiation comprising the steps of:
detecting radiation emitted by the tissue from beneath the tissue surface; and
determining a spatial extent of the optical break through, a position of the optical break through or both of the foregoing from detection of the emitted radiation.

20. (Withdrawn) The method as claimed in Claim 19, wherein the spatial extent, the position or both of scattering centers generated by the optical break-through is determined.

21. (Withdrawn) The method as claimed in Claim 19, wherein observation radiation is directed into the tissue, and radiation emitted by the tissue in the form of back-reflection is evaluated.

22. (Withdrawn) The method as claimed in Claim 20, wherein the radiation emitted by the tissue is interferometrically detected.

23. (Withdrawn) The method as claimed in Claim 22, wherein a position of the radiation emitted by the tissue along an optical axis of detection is determined from occurring interference.

24. (Withdrawn) The method as claimed in Claim 19, wherein the radiation emitted by the tissue is detected by confocal imaging and the spatial extent is determined by adjusting a focus of said confocal imaging.

25. (Withdrawn) The method as claimed in Claim 24, wherein different spectral focal points are generated in confocal imaging by dispersive optics and radiation recorded behind a pinhole is spectrally evaluated.

26. (Withdrawn) The method as claimed in Claim 21, wherein spectrally different radiation is sequentially directed toward the tissue and the radiation emitted by the tissue is sequentially recorded.

27. (Withdrawn) The method as claimed in Claim 19, wherein the emitted radiation is detected along an optical axis which is oblique relative to an optical axis along which the treating laser radiation or observation radiation is directed into the tissue.

28. (Withdrawn) The method as claimed in Claim 27, wherein the treatment radiation is directed into the tissue as a slit-shaped beam.

29. (Withdrawn) The method as claimed in Claim 27, wherein an angle between the optical axis of detection and the optical axis of irradiation is adjusted to obtain information on the spatial extent of the interaction.

30. (Withdrawn) The method as claimed in Claim 19, wherein a measure of the spatial extent of individual scattering centers of the optical break-through is generated.

31. (Withdrawn) The method as claimed in Claim 30, wherein a diameter of a plasma bubble is determined.

32. (Currently Amended) A method of measuring and treating a transparent or semi-transparent tissue, the method comprising:

providing illumination laser radiation;

focusing the illumination laser radiation at a focal point in the tissue;

three dimensionally scanning the tissue with the illumination laser radiation by changing the position of the focal point within the tissue in three dimensions;

detecting tissue-specific signals induced by said focusing;

assigning the detected tissue specific signals to respective positions of the focal point at which the tissue-specific signals were detected, wherein the respective positions of the focal point constitute points of measurement located within the tissue;

determining ~~of position~~ positions of boundaries in the tissue, inclusions in the tissue or both by filtering out the points of measurement at which predefined values were detected for the tissue specific signals;

defining target points within the tissue based on the points of measurement remaining after the filtering out;

performing a subsequent treatment of the tissue by focusing treating laser radiation into the tissue and scanning the treating laser radiation over the target points within the tissue;

wherein the illumination laser radiation and the treating laser radiation are provided from the same laser radiation source; and

wherein the treating laser radiation and the illumination laser radiation are focused and scanned by the same optical elements.

33.- 34. (Cancelled)

35. (Previously Presented) The method as claimed in Claim 32, further comprising selecting the target points from the measurement points such that the target points are a subgroup of the measurement points.

36. (Previously Presented) The method as claimed in Claim 32, further comprising repeatedly determining the points of measurement and the target points; and

applying treating laser radiation to the target points.

37. (Currently Amended) A device for measuring and treating a transparent or semi-transparent tissue, comprising:

a source of laser radiation that emits illumination laser radiation;

a deflecting unit that deflects the illumination laser radiation;

a focusing unit that focuses the illumination laser radiation at a focal point in the tissue;

a detector unit that detects tissue-specific signals induced in the tissue by the focused illumination laser radiation; and

a control unit which controls the source of laser radiation, the deflecting unit and the focusing unit operably interacting such that the position of the focal point is three-dimensionally scanned by the deflecting unit and the focusing unit over a plurality of positions within the tissue;

wherein the detector unit provides to the control unit signals representing the tissue-specific signals;

wherein said control unit assigns said signals to respective positions of the focal point at which the tissue specific signals were detected, and wherein the respective positions of the focal point constitute points of measurement within the tissue [[point]], and wherein the control unit determines positions of boundaries in the tissue within the tissue, inclusions within the tissue or both by filtering out the points of measurement at which predefined values were detected for the tissue specific signals;

wherein the control unit further determines target points within the tissue for a subsequent treatment of the tissue by focused treating laser radiation based on the points of measurement filtered out;

wherein the source of laser radiation also emits the treating laser radiation; and

wherein the treating laser radiation and the illumination laser radiation are both deflected by the deflecting unit and focused by the focusing unit.

38.-39. (Cancelled)

40. (Previously Presented) The device as claimed in Claim 37, wherein the control unit selects the target points from the points of measurement thereby making the target points a subgroup of the points of measurement.

41. (Previously Presented) The device as claimed in Claim 37, further comprising an energy reducer, following the source of laser radiation in the beam path and which is selectably activatable to moderate the laser radiation emitted by the source of laser radiation to provide said illumination laser radiation.

42. (Previously Presented) The method as claimed in claim 32, further comprising detecting tissue-specific signals by detecting back-scattered illumination radiation.

43. (Previously Presented) The device as claimed in claim 37, wherein the detector unit detects back-scattered illumination radiation as the tissue specific signals.